

STP Quarterly Review

12 Nov 2013

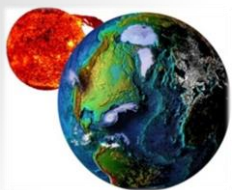
4QFY13



William Denig
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NOAA/NESDIS/NGDC

303 497-6323

William.Denig@noaa.gov



OUTLINE

Solar & Terrestrial Physics Division

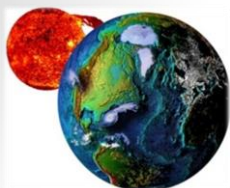
➔ STP Division Overview

Milestones & Metrics

Accomplishments & Updates

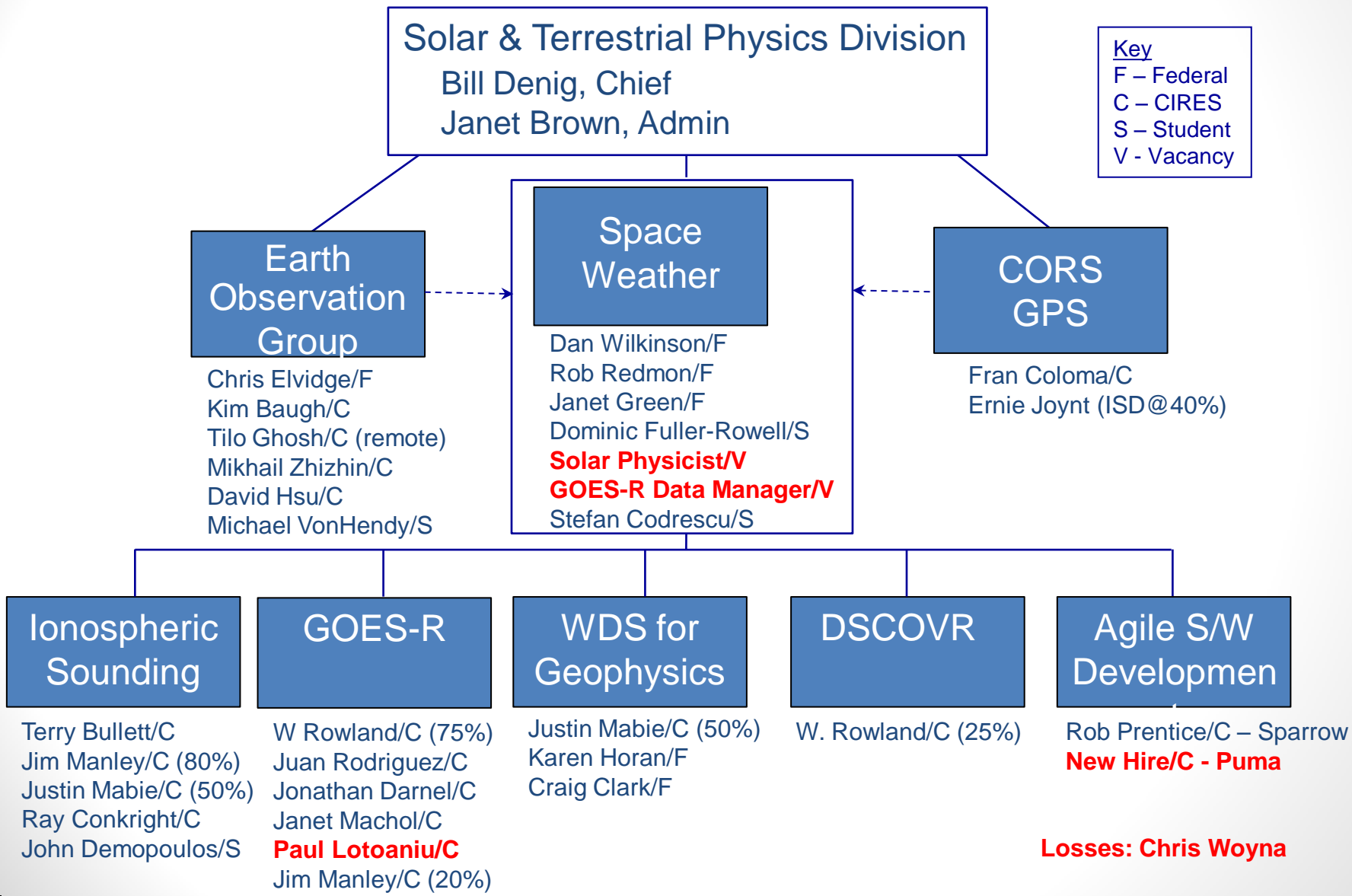
Professional Activities

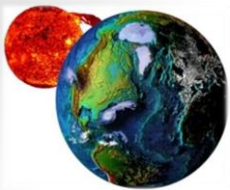
Issues & Summary



STP Division Overview

STP Organizational Chart





STP Division Overview

Hail and Farewell

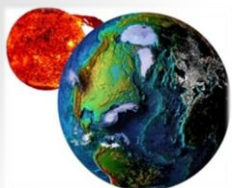
Paul Lotoaniu joins us from the Australian Bureau of Meteorology (Melbourne) and before that from the SWPC. He joins the GOES-R Team.



Sylvia Reed Darnel was born at 23:40 on October 17, 2013. She weighed in at 5lbs, 3oz. Jonathan and Cassandra are the proud parents.



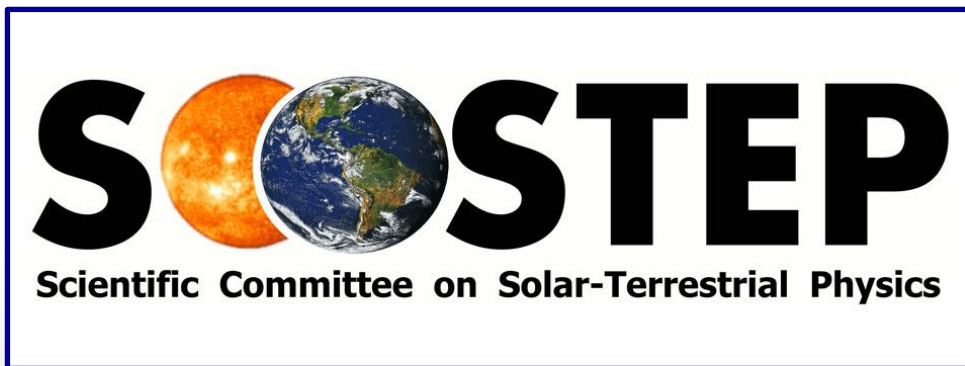
**Next Quarter's
Featured Baby:
Liam Fletcher Rowland**



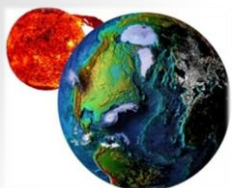
STP Division Overview

J. Allen – SCOSTOP Service Award

Joe Haskell Allen has been selected as the first recipient of the SCOSTEP Service Award. Joe will be presented with this award at the International CAWSES II Symposium, 18-22 November 2013 in Nagoya, Japan.



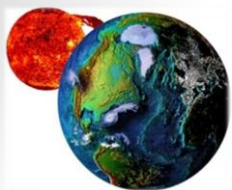
Joe is the former chief of the Solar-Terrestrial Physics Division (NGDC)



STP Division Overview

Government Shutdown Impacts

STP Product	Data Ingest	User Access	
GOES	Ingest of process GOES data from SWPC was unaffected	No external user access to historical GOES data	
POES	Ingest of unprocessed data from NSOF was unaffected	No external user access available, including AFWA for tool development	
VIIRS	No VIIRS data was available from CLASS - no product generation possible	No ability to provide data and products	
DMSP	Ingest of DMSP data from AFWA was unaffected	DMSP subscription services via http remained available	
DMSP McMurdo	Ingest of McMurdo data ingest from AWA was unaffected	Access to McMurdo data via http remained available in compliance with State Dept/Antarctic Treaty policies	
Space Weather (non NOAA satellite)	Access to procedures for acquiring data impacted - now recovered	No external user access to space weather data	
Mirrior (historical)	Ability to monitor ingest functions impacted - no lost data. No ability to maintain instrumentation.	No external user access to historical ionosonde data was available	
Mirrior (operational)	Ability to monitor ingest functions impacted - no lost data. No ability to maintain instrumentation.	AFWA access to real-time ionosonde data was maintained	
OVATION (operational)	Input data acquired from SWPC was unaffected	No external user access was available including to SWPC for operations	
CORS (historical)	Ingest data not affected	No external access to CORS data via CLASS was available	
CORS (operational)	Ingest data not affected	SWPC/ESRL access OK Emergency response OK	No public access
Lessons learned:			
- Fed-Ex packages received during the shut-down may have been returned to sender as "undeliverable".			
- Provide written directives, including notes of where rules are still uncertain or discrepancies among parties.			
- Preplan for operational user access to NGDC data and products via http.			



OUTLINE

Solar & Terrestrial Physics Division

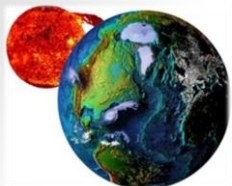
STP Division Overview

➔ Milestones & Metrics

Accomplishments & Updates

Professional Activities

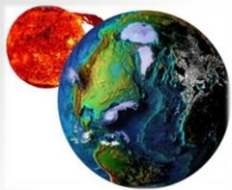
Issues & Summary



Milestones and Metrics

FY13 Status Overview

FY13 Milestones		+-----FY13-----+			
Space Weather Program		Q1	Q2	Q3	Q4
Spacecraft Charging	Host technical workshop on the release of the next generation radiation belt models referred to as AP9/AE9 (Green/1QFY13)	C			
PeEPS	Demonstrate at the American Geophysical Union 2012 Fall Meeting new capabilities for the social media utility referred to People Empowered Products (Green-Redmon/1QFY13)	C			
DMSP SWx	Develop an 11-year database of calibrated precipitating electron and ion fluxes from the Defense Meteorological Satellite Program Special Sensor Electron and Ion Spectrometer (Redmon/3QFY13)			C	
World Data Service					
Monthly Bulletins	Resume monthly production of the NOAA/NGDC Geomagnetic Indices Bulletin and Solar Indices Bulletin (Mabie-Clark/1QFY13)	C			
Ionosonde Data Services					
Ionosonde Installation	Promote scientific research within Africa by installing a new-generation, advanced research ionospheric sounder at Maseno University on the equator near Kisumu, Kenya (1QFY13/Bullett/1QFY13)	C			
GOES-R Program Support					
GOES-R Cal/Val	Identify and complete key tasks for GOES-R space weather calibration-validation [vice Shouldis/1QFY13]	C			
GOES-R RR/AR	Complete Critical Design Reviews for selected Level 2+ ground-processing algorithms for the GOES-R space weather sensors (vice Shouldis/3QFY13)			C	
DSCOVR Program Support					
DSCOVR RTA	Prepare and submit to the NGDC Data Manager a Request To Archive (RTA) for space environmental data from the NOAA Deep Space Climate Observatory (DSCOVR) mission (Denig/1QFY13)	C			
DSCOVR CONOPS	Prepare a high-level CONcept of Operations (CONOPS) for the Archive, Access, and Assessment (AAA) of solar wind data from the Deep Space Climate Observatory (DSCOVR) mission (Denig/1QFY13)	C			
DSCOVR SA	Draft an initial Submission Agreement (SA) for acquiring processed Deep Space Climate Observatory (DSCOVR) data received from the NWS Space Weather Prediction Center (Denig/2QFY13)		C		
SPADES	Develop key functional elements of the Satellite Product Analysis and Distribution Enterprise System (SPADES) to support the Deep Space Climate Observatory (DSCOVR) mission (Rowland/3QFY13)			C	
DSCOVR ICD	Prepare a draft Interface Control Document (ICD) for the the NGDC-to-archive interface for the Deep Space Climate Observatory (DSCOVR) mission data (Rowland/4QFY13)				C
Earth Observations					
VIIRS Gas Flares	Use Suomi National Polar Partnership (S-NPP) Visible Infrared Imaging Radiometer Suite (VIIRS) data to produce a global map of detected gas flares ranked from largest to smallest (Elvidge/4QFY13)				C
VIIRS Nighttime Lights	Create a global cloud-free composite map of nighttime lights derived from Suomi National Polar Partnership (S-NPP) Visible Infrared Imaging Radiometer Suite (VIIRS)S data (Elvidge/4QFY13)				C
		As of 05 Nov 13			



Milestones and Metrics

FY13 Metrics Overview

Space Weather Metric							
Goal	Objective	Performance Measure	POC	1QFY13	2QFY13	3QFY13	4QFY13
Weather-Ready Nation (NWS)	A More Productive and Efficient Economy Through Environmental Information Relevant to Key Sectors of the U.S. Economy	Maintain a greater than 97% (2-sigma, cumulative distribution) of available Space Environment Monitor (SEM) data from the Geostationary Operational Environmental Satellites (GOES) archived on an annual basis	Wilkinson	100%	100%	100%	100%
Ionosonde							
Goal	Objective	Performance Measure	POC	1QFY13	2QFY13	3QFY13	4QFY13
Weather-Ready Nation (NWS)	Resilient Coastal Communities That Can Adapt To The Impacts Of Hazards And Climate Change	Acquire, process and disseminate > 97% (2-sigma, cumulative distribution) of available real-time ionosonde data within 1 hour [TBD] of receipt	Bullett	100%	100%	100%	100%
Nighttime Lights Metric							
Goal	Objective	Performance Measure	POC	1QFY13	2QFY13	3QFY13	4QFY13
Climate Adaptation and Mitigation (CS)	Improved Scientific Understanding of the Changing Climate System and Its Impacts	Acquire, process and disseminate >97% (2-sigma, cumulative distribution) of available real-time nighttime lights imagery within 3 hours of receipt	Elvidge	100%	100%	100%	100%
CORS (See Note)							
Goal	Objective	Performance Measure	POC	1QFY13	2QFY13	3QFY13	4QFY13
Resilient Coastal Communities and Economics (NOS)	Resilient Coastal Communities That Can Adapt To The Impacts Of Hazards And Climate Change	Provide a >97% (2-sigma, cumulative distribution) availability for CORS near-real-time data to the NWS Space Weather Prediction Center (SWPC) as per the '4-way' Memorandum of Agreement and subject to normal business-hour response times.	Coloma	100%	100%	100%	100%

As of 04 Nov 13



Greater than 99% (3-sigma) Cumulative Distribution



Greater than 97% (2-sigma) Cumulative Distribution

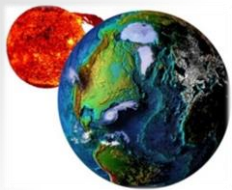


Greater than 84% (1-sigma) Cumulative Distribution



Below 84.1% (1-sigma) Cumulative Distribution

Note: On 9/16 the FAA WAAS down at source for 14.77 hrs (39 sites)

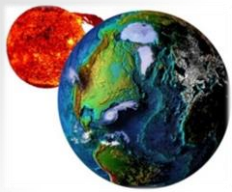


Milestones and Metrics

STP FY14 Milestones

Quarter	Milestone	AOP
Q1	Produce Radiation Belt Indices for satellite situational awareness as requested by the Air Force Weather Agency. (Green)	NO
Q2	Ensure required infrastructure is in place to receive, archive and disseminate Deep Space Climate Observatory (DSCOVR) solar-wind data products prior to the DSCOVR launch readiness date. (Denig)	YES
Q2	Return the Ap* geomagnetic index to operations. (Mabie)	NO
Q2	Implement ingest of the NOAA Space Environment Monitor data into the NASA Coordinated Data Analysis web to increase public access to the data. (Green)	NO
Q2	Complete delivery of Level 2+ product Algorithm Theoretical Basis Documents for the Geostationary Operational Environmental Satellite series-R space weather products. (Rowland)	NO
Q3	Deliver to the GOES-R Program Office an initial set of calibration and validation tools for Post-Launch Testing of the space weather sensors on the GOES-R series spacecraft. (Rowland)	NO
Q4	Complete an initial re-design of the Space Physics Interactive Data Resource to enable more efficient processing and enhanced usability. (Zhizhin)	NO
Q4	Recalibrate the NOAA solar irradiance data product from the Extreme Ultraviolet Sensors on the GOES-13, GOES-14 and GOES-15 satellites and provide public access to the data. (Machol)	NO
Q4	Initiate construction of a state-of-the-art ionospheric sounder in the Antarctic for the Korean space weather program. (Bullett)	NO
Q4	Create initial "Cloud-free Composite of Nightlights of the World" product using data from the NOAA Visible Infrared Imaging Radiometer Suite. (Elvidge)	YES

As of 11 Nov 2013



OUTLINE

Solar & Terrestrial Physics Division

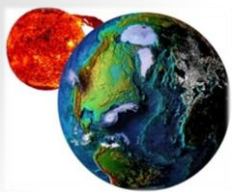
STP Division Overview

Milestones & Metrics

➔ Accomplishments & Updates

Professional Activities

Issues & Summary



Earth Observation Group

Mission: *Global Mapping of Nighttime Lights and Combustion Sources Using VIIRS Imagery Data*

Multispectral VIIRS detections are used to map lights and combustion sources worldwide

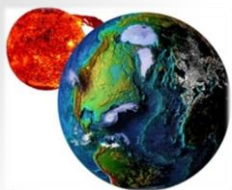
Actions:

- Construct research quality monthly/annual maps of nighttime lights – change detection, socio-economic, and ecological studies.
- Provide nightly, global data on the location, temperature, source size and radiant heat of infrared emitters such as gas flares, biomass burning, volcanos and industrial sites.
- Detect and characterize anomalous events worldwide:
 - Lac-Mégantic Rail Disaster – 06 Jul 13
 - ➡ – Hercules 265 Platform Fire – 23 Jul 13
 - Erie Gas Pipeline Explosion – 13 Aug 13
 - ➡ – Mt Sakurajima Eruption – 18 Aug 13



FY13 Accomplishments:

- Near RT VIIRS Nightfire product
- VIIRS fire pixel detection system
- Dual Planck curve fitting procedure
- Top 100 gas flares worldwide
- Five (5) peer reviewed publications
- Two (2) FY13 milestones



Earth Observation Group

4Q FY13 Milestone: Ranking Gas Flares

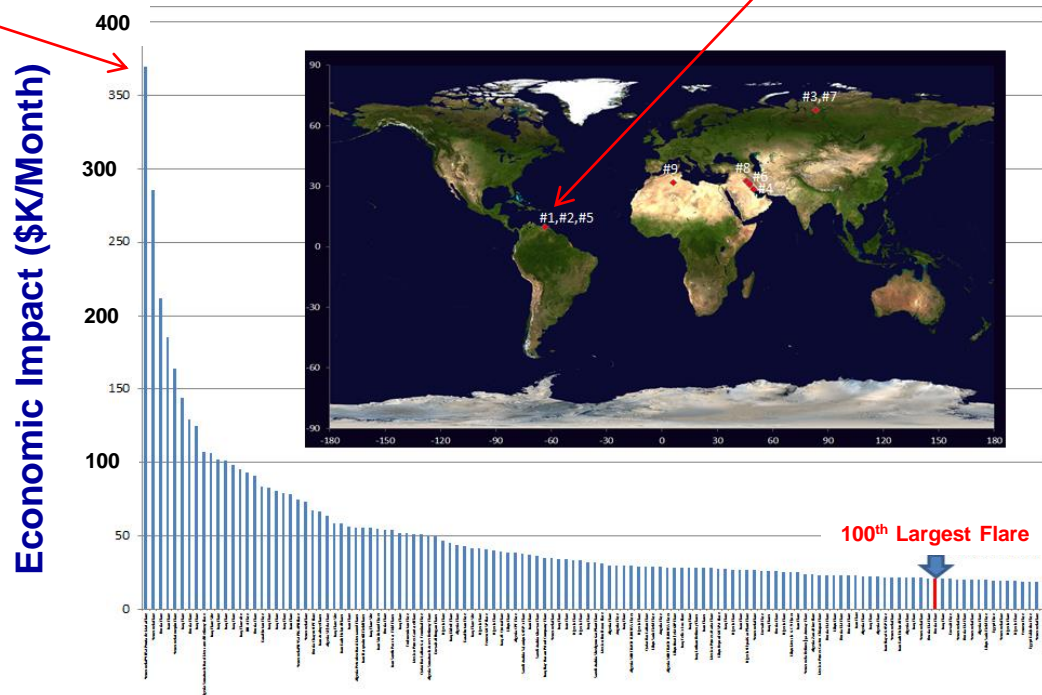
Milestone: Use Soumi National Polar Partnership (S-NPP) Visible Infrared Imaging Radiometer Suite (VIIRS) data to produce a global map of detected gas flares ranked from largest to smallest. (Elvidge/4QFY13)

Planned: 30 Sep 2013

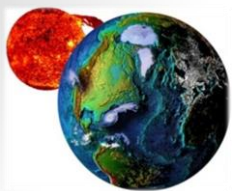
Actual: 30 Sep 2013



Status: Completed. Largest detected gas flare is located at Punta de Mata operated by Petr leos de Venezuela, S.A. (PDVSA).



100 Largest Flares



Earth Observation Group

4Q FY13 Milestone: VIIRS Cloud-free Composite

Milestone: Create a global cloud-free composite map of nighttime lights derived from Soumi National Polar Partnership (S-NPP) Visible Infrared Imaging Radiometer Suite (VIIRS)S data. (Elvidge/4QFY13)

Planned: 30 Sep 2013

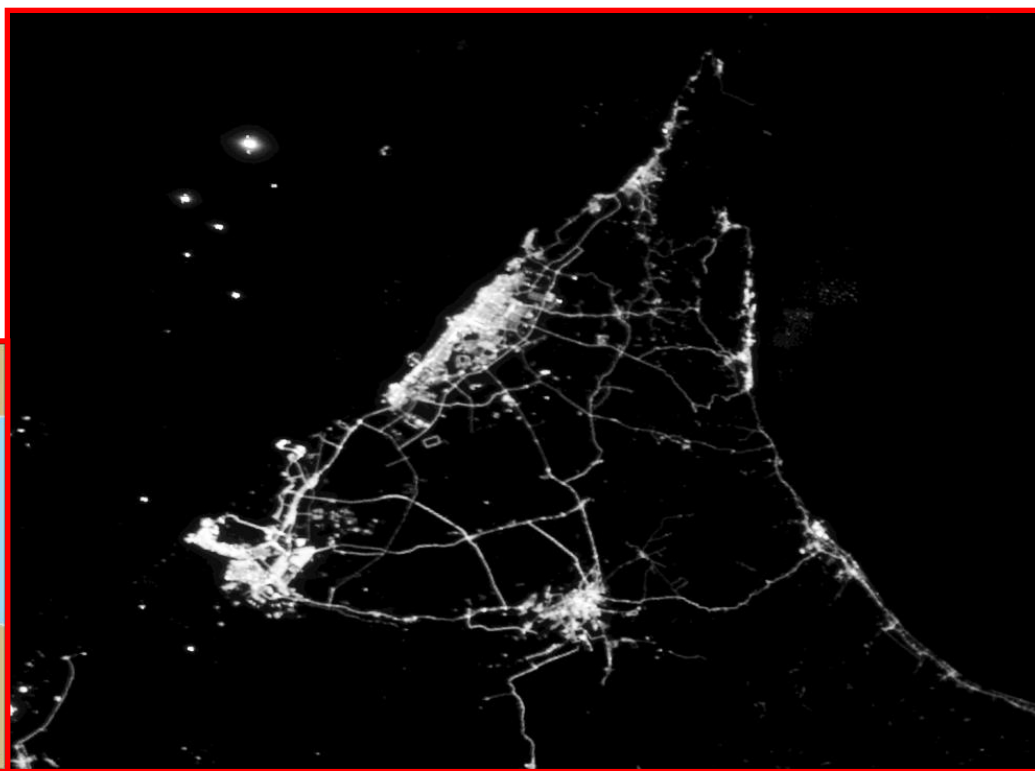
Actual: 30 Sep 2013

Status: Completed.

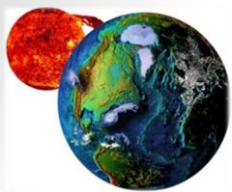
Image on the right is a local cloud-free composite for the United Arab Emirates. Data from the VIIRS DNB was used to create the global cloud-free composite.



United Arab Emirates / Oman



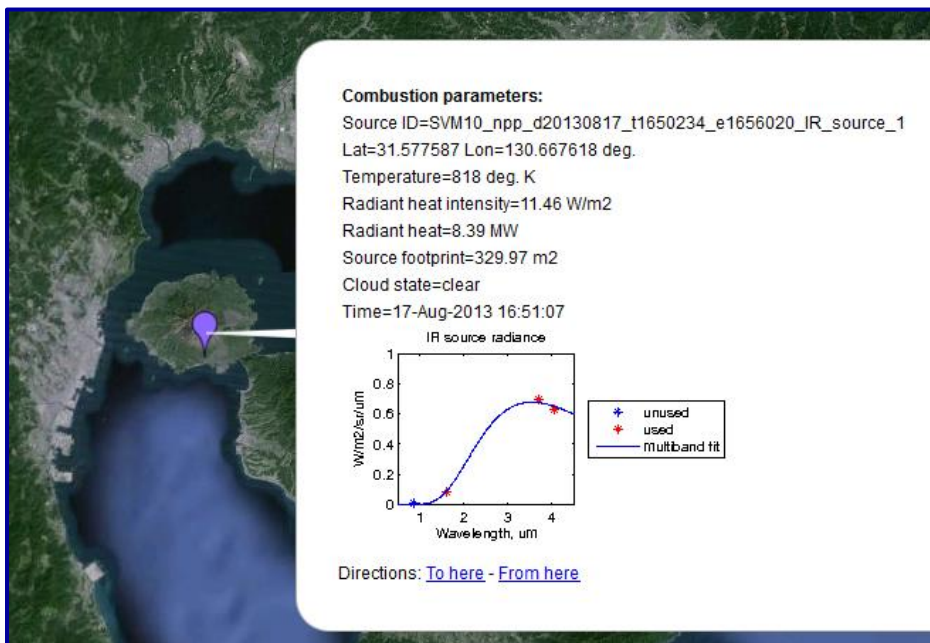
[VIIRS Nighttime Lights](#)



Earth Observation Group

Accomplishment: Mount Sakurajima Eruption

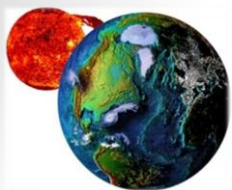
At 16:31 (local time) on 18 Aug 2013 the Japanese volcano on Mt Sakurajima had a significant eruption resulting in a 5,000-m ash plume and causing darkness and significant ash falls on the central part of Kagoshima city. The volcano's thermal anomaly was detected by the Visible Infrared Imaging Radiometer Suite (VIIRS) fourteen hours before the eruption. The detection temperature was 818 °K with a source footprint of 330 m².



As reported in the [NESDIS News Archive](#)

NGDC POC: Chris Elvidge

STP 4QFY13 12-NOV-13



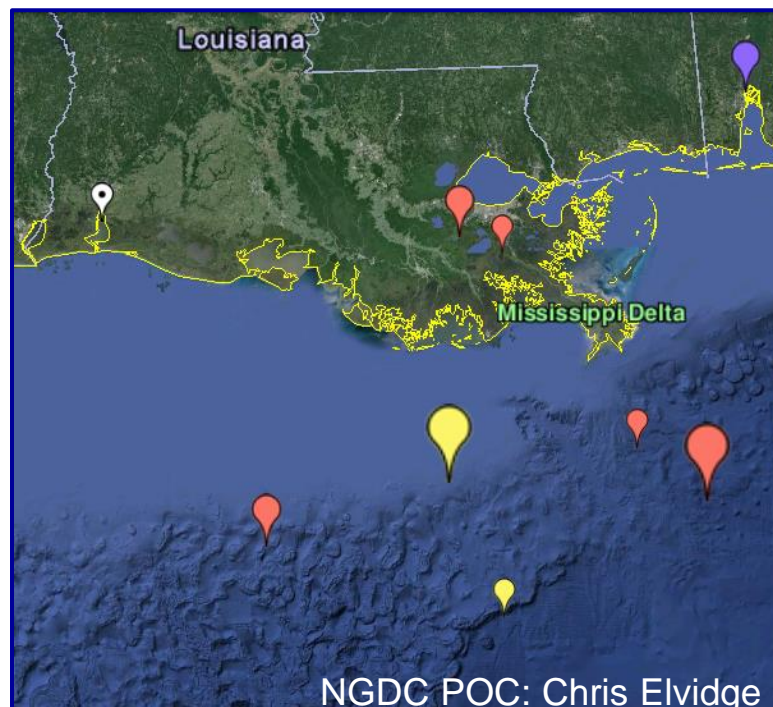
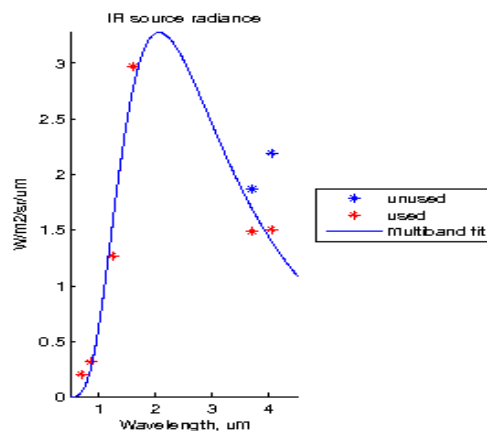
Earth Observation Group

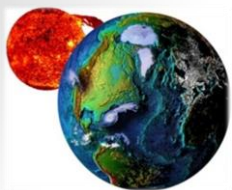
Accomplishment: Natural Gas Platform Blaze

Fire broke out on the Hercules 265 gas platform around 10:50 p.m. (CDT) on 23 Jul 2013. The platform is located around 55 miles off the Louisiana coast in the Gulf of Mexico. The blaze was detected by the NPP VIIRS at 02:33 on 24 Jul and processed by the EOG real-time system with data available online by 04:26.



Combustion parameters:
Source ID=SVM10_npp_d20130724_t0731420_e0733062_IR_source_28
Lat=28.381493 Lon=-90.528130 deg.
Temperature=1402 deg. K
Radiant heat intensity=32.36 W/m²
Radiant heat=23.84 MW
Source footprint=108.87 m²
Cloud situation=cloudy
Time=24-Jul-2013 07:33:14



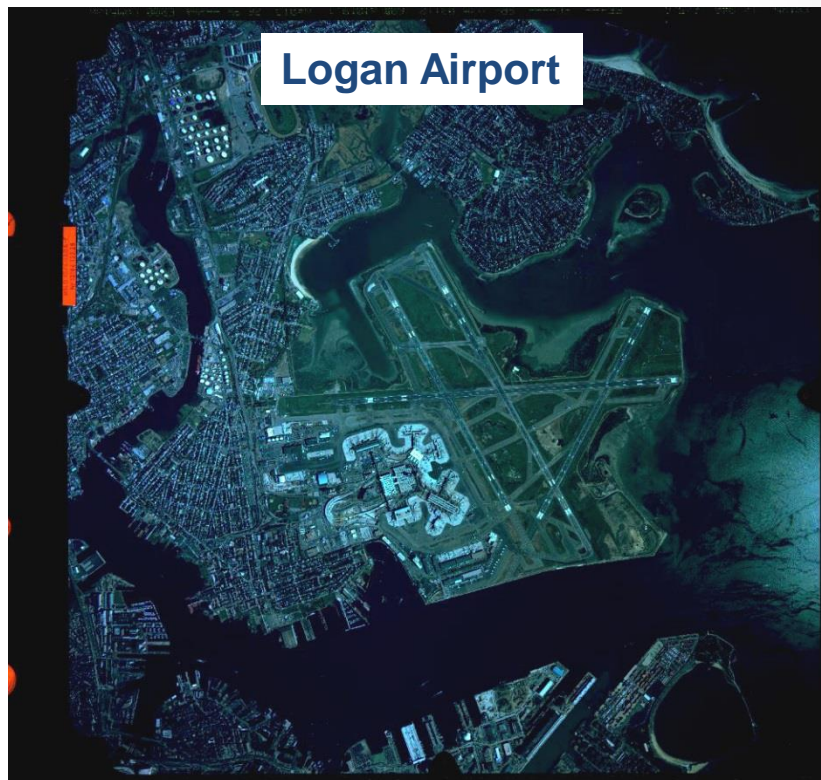


Earth Observation Group

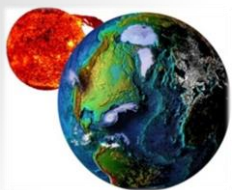
Issue: NGS Aerial Photography



The NOS/NGS is responsible for managing NOAA's vast collection of historical aerial photographs. A subset of the collection was managed and inventoried locally by the EOG. These records are currently stored at the Denver FRC and attempts to transfer responsibility to or recoup oversight costs from NGS have been unsuccessful. The collection is due some modest attention but the simplest solution is to “kick the can” down the road with a 10-year hold. Alternatively, **NGS can be pressured to step up to their responsibility as the data provider.**



Note: About 10% of the collection was digitized under the Climate Database Modernization Program (CDMP) which has now been scaled back to include only NCDC records.



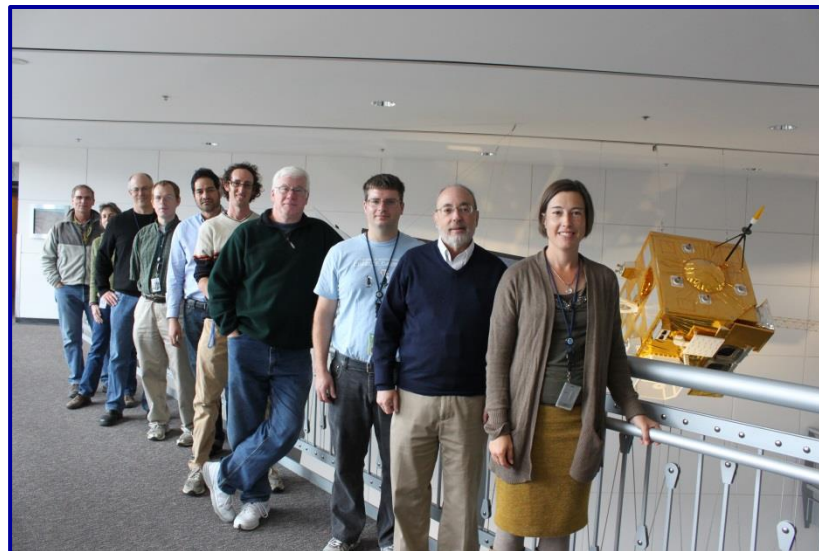
Space Weather Team

Mission: *Provide Long-Term Scientific Stewardship for NOAA Space Weather (SWx) Data and Information*

Supporting NOAA's satellite acquisition, pre/post launch operations and space environmental monitoring program

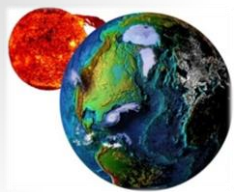
Actions:

- Manage the 30+ year historical record of space environmental data from GOES and POES (also DMSP).
- Develop ground processing algorithms for producing operational space weather products for GOES-R.
- Assume responsibility for the satellite sensor cal-val and monitor in-flight performance and calibration (SWx).
- Plan for the acquisition and archive of DSCOVR space weather products.
- Cross-LO team – NESDIS/NGDC and NWS/SWPC



Supporting Satellite Programs:

- GOES I-M / NOP / RSTU
- POES/MetOp
- DSCOVR
- DMSP
- Related ground observations
- Ten (10) FY13 milestones



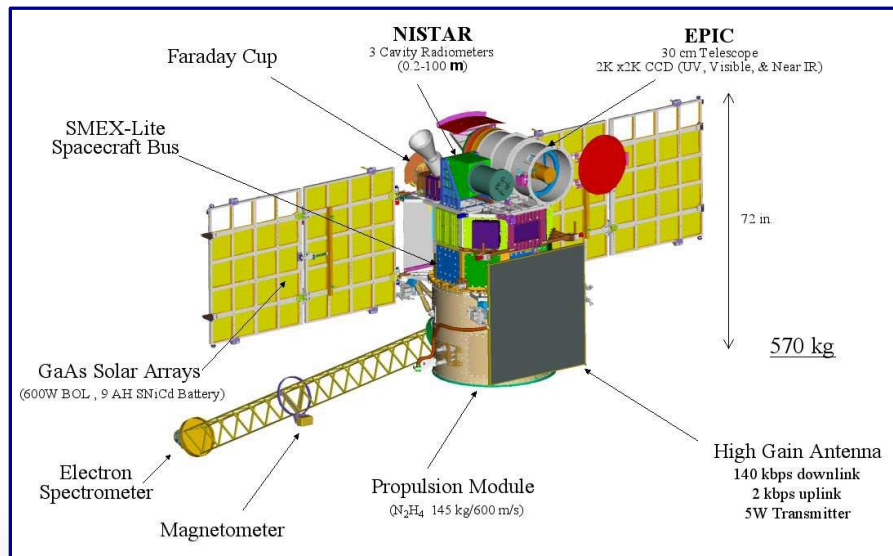
Space Weather Team

4Q FY13 Milestone: DSCOVR/NGDC ICD

Milestone: Prepare a draft Interface Control Document (ICD) for the NGDC-to-archive interface for the Deep Space Climate Observatory (DSCOVR) mission data. (Rowland/4QFY13)

Planned: 31 Sep 2013 **Actual:** 18 Sep 2013

Status: Completed. Draft ICD submitted to the DSCOVR program office on 18 Sep 2013.



DSCOVR-ICD-002042
Revision -
Effective Date: CM add upon Release
Expiration Date: CM add upon Release

DRAFT

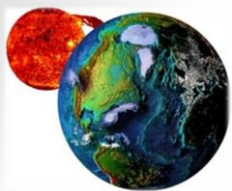
**Deep Space Climate Observatory
National Geophysical Data Center
Interface Control Document**

Draft 1: September. 18, 2013

National Aeronautics and
Space Administration

Goddard Space Flight Center
Greenbelt, Maryland

CHECK WITH DSCOVR DATABASE AT:
<https://dscovr-cgm.fdt.nasa.gov>
TO VERIFY THAT THIS IS THE CORRECT VERSION PRIOR TO USE.



Space Weather Team

Accomplishment: Common Ingest (DSCOVR/ENLIL)

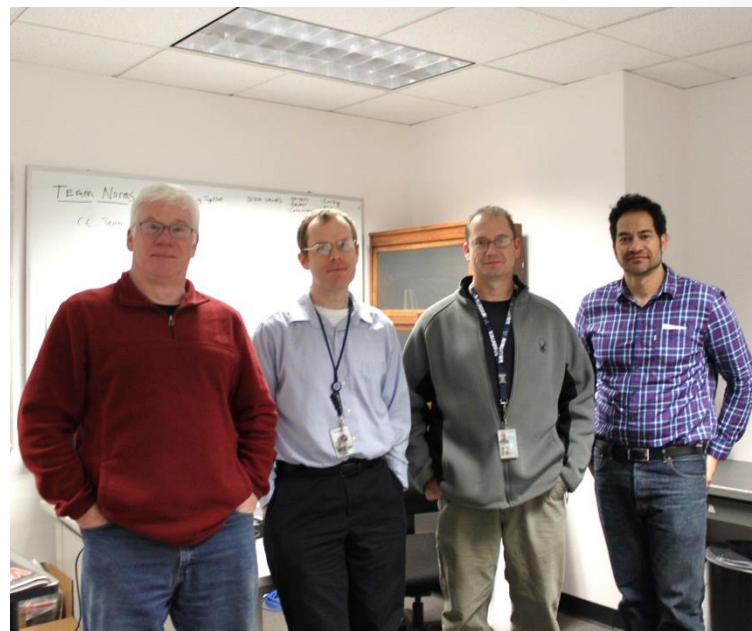
Roles & Responsibilities: Provide scientific data stewardship of interplanetary data from NOAA's Deep Space Climate Observatory.

NGDC Key Dates:

Release #1 30Sep13 Common Ingest
Release #2 28Feb14 NEXT Access
Launch Release 30Apr14 End-to-End Tests

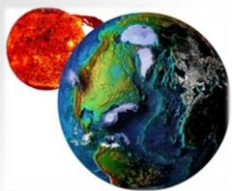
DSCOVR Key Dates:

KDP-C 08/2013 Single Design Review
KDP-D 01/2014 Mission Operations Review
KDP-E 01/2015 Launch Readiness Review



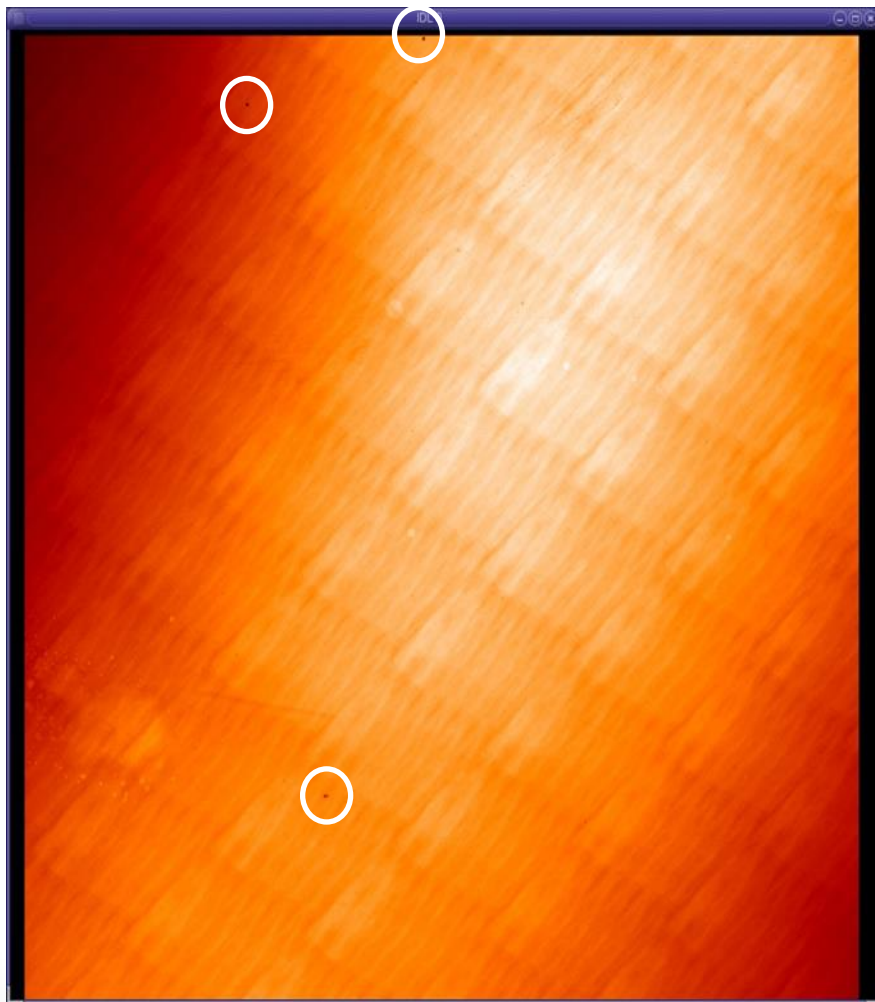
Thanks Team Puma

NGDC POC: John LaRocque

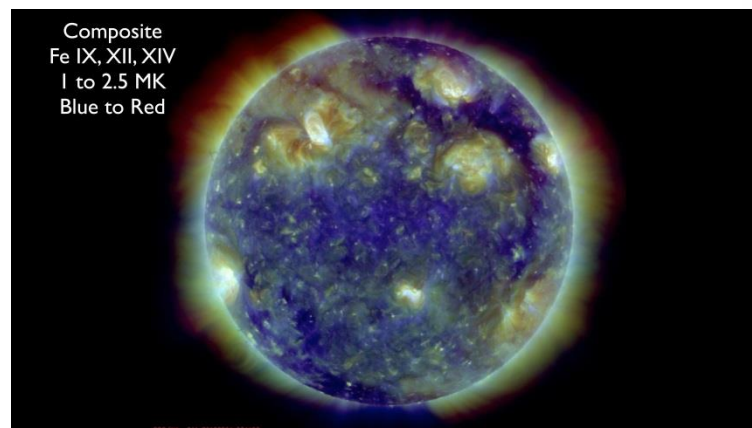


Space Weather Team

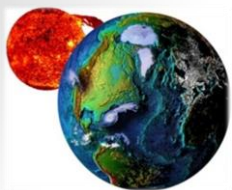
Accomplishment: GOES-R SUVI Dark Pixels



Jonathan Darnel was requested by the GOES-R Program Office to assess the impact of SUVI dark (bad) pixel clusters on derived space weather products. The image to the left is the pixel map or SUVI FM1. Initial finding is that isolated clusters of bad pixels do not degrade derived operational products.



SDO/AIA Image (171 Å / 195 Å / 211 Å)

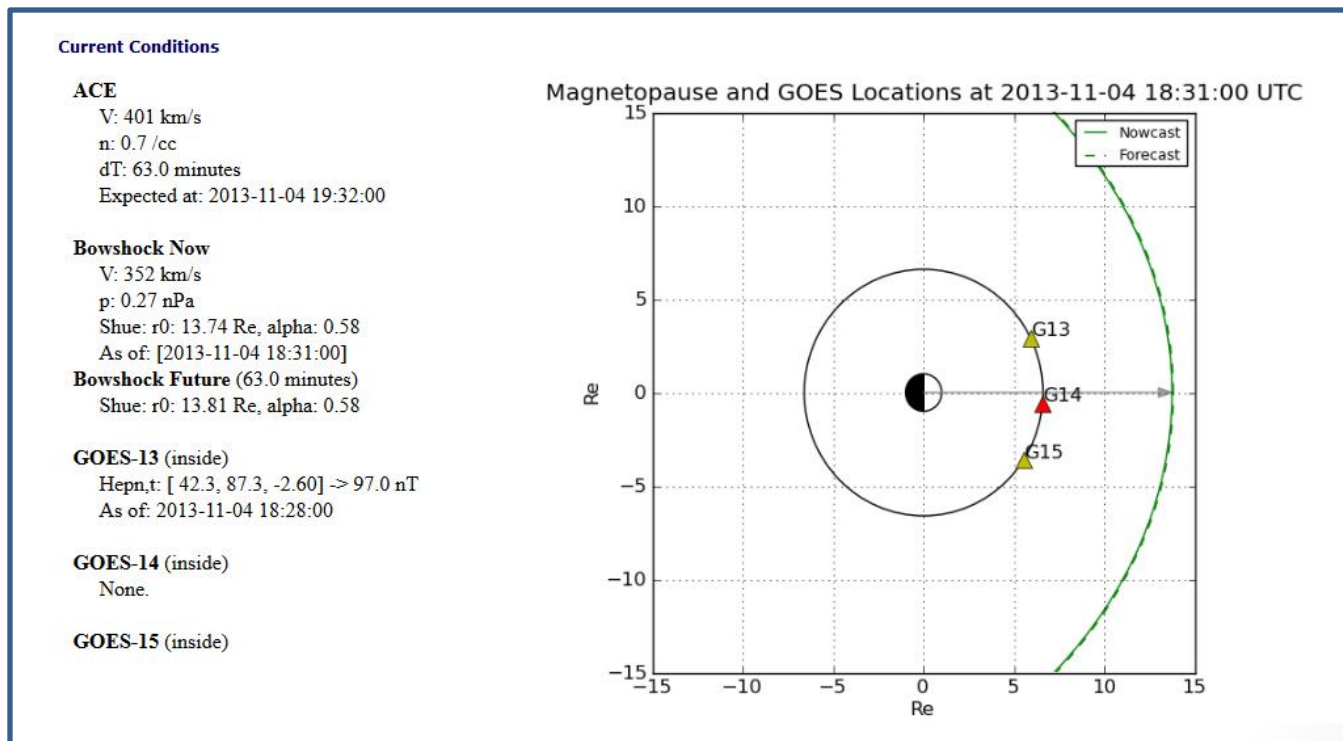


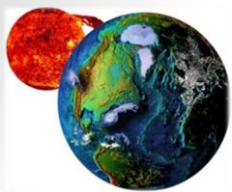
Space Weather Team

Accomplishment: Magnetopause Algorithm

Real-Time Magnetopause Location and GEO Crossing Detection (beta)

The Magnetopause Location and Geosynchronous Crossing Detection is a real-time forecast and nowcast prototype for GOES-R. [Model](#) is updated every minute with an automatic web display automatically refreshes. The model output below represents Shue et al. [1998] modeled magnetopause standoff distance in earth radii. Development funded by the SPSRB program.





Space Weather Team

Issue: GOES-R SWx Algorithm Risks

BLUF: The SWx team has prepared list of program risks (unofficial) / solutions associated with the GOES-R ground system “frozen baseline” & lack of user access to L0 data.

- Issue 1: **Frozen baseline locks in faulty operational SWx algorithms** that will produce (at best) erroneous L1b products for the SSEIS and EXIS and (at worst) nonsensical products for MAG – *current ATBDs correct many, but not all, deficiencies.*
- Issue 2: **Proposed waivers relieve sensor vendors of responsibility** of meeting requirements – *limited access to CM system puts us at a disadvantage.*
- Issue 3: **Lack of ready/timely access to L0 data** could affect our ability to generate L1b products in house – *a defined task within the full cal-val program.*
- Issue 4: **No clear path to correct operational L1b algorithms** after launch – *post launch mechanism for pre-planned product improvements (P³I) is undefined.*

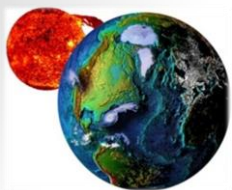
Solution: Either correct operational algorithms pre-launch or define path forward; restrict applicability of waivers; permit timely access to L0 data; plan for long-term logistics



BLUF – Bottom Line Up Front



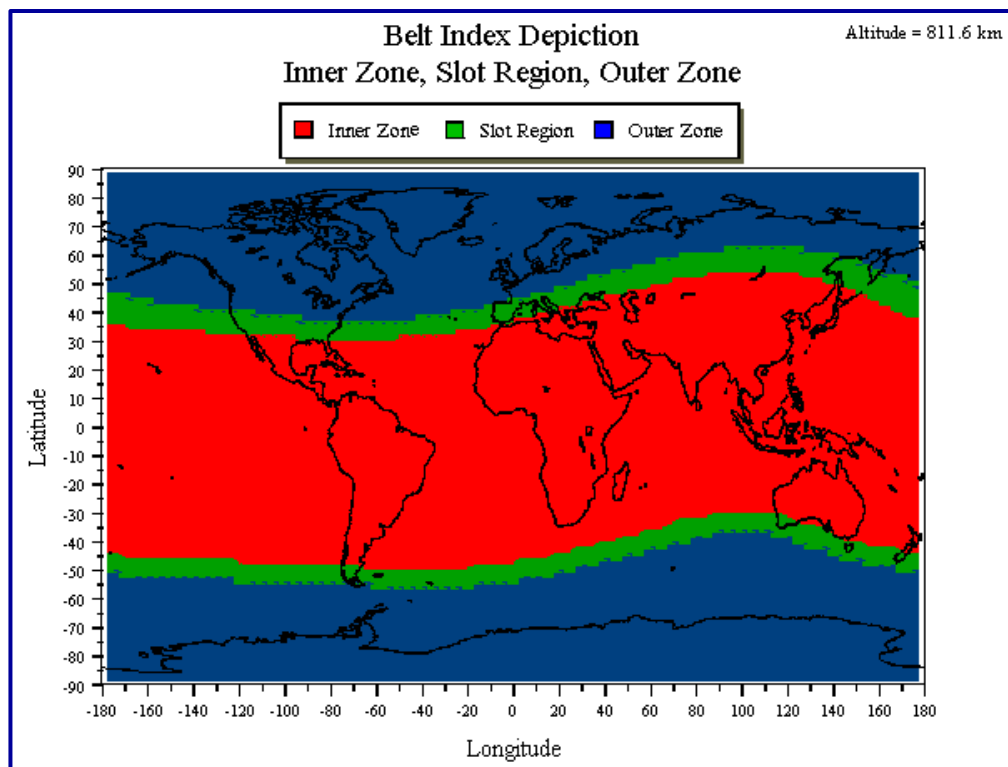
NGDC POC: Janet Machol



Space Weather Team

Accomplishment: Radiation Belt Indices (AFWA)

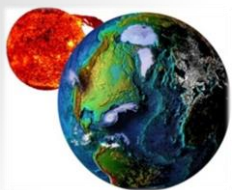
As a part of the POES re-processing NGDC is now producing a set of radiation belt indices. The indices identify times when distinct regions are above or below normal. The Air Force Weather Agency (**AFWA**) is a designated user of the belt indices.



The NOAA availability of these indices will likely be included in Environmental Satellite Data Annex to the MOA on Data Acquisition, Processing & Exchange (**DAPE**).



[Link](#)



Space Weather Team

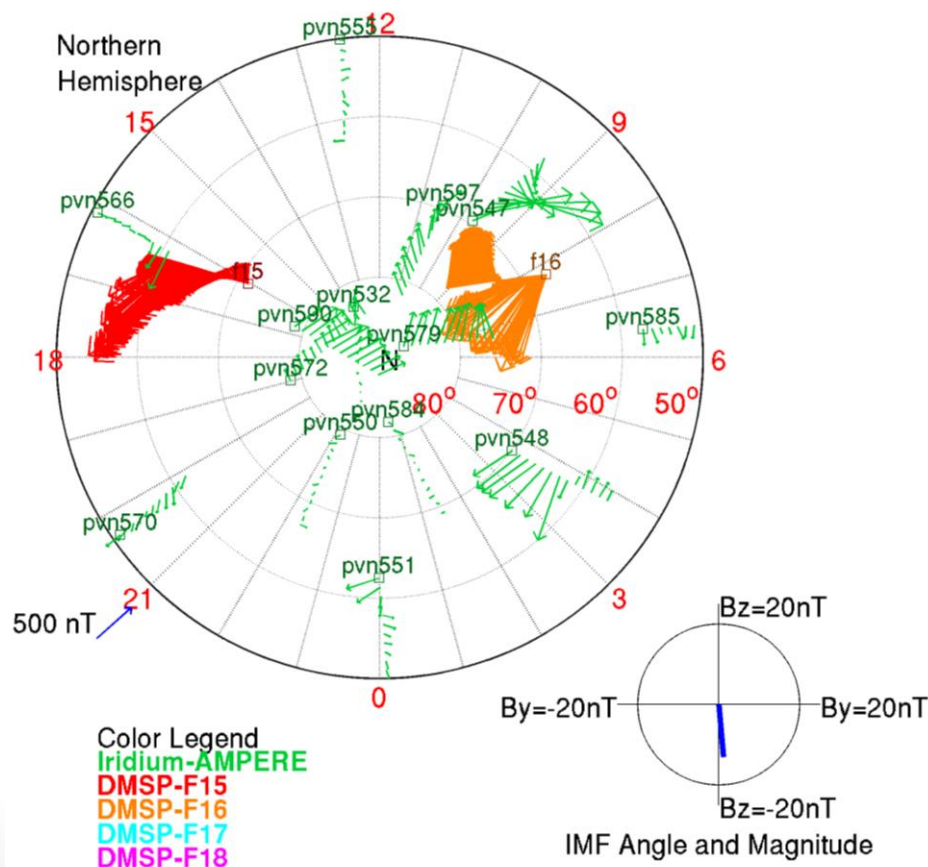
Accomplishment: AMPERE vs DMSP

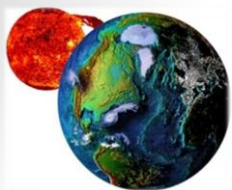
Professor Delores Knipp and Rob Redmon are examining magnetic perturbations from LEO satellite data to better understand energy and mass flows within the coupled magnetosphere-ionosphere system.

Satellite constellations utilized include DMSP, Iridium-AMPERE and soon ST5. Tools have been created to map fields into the APEX coordinate system, locate conjunctions based on temporal and spatial constraints and assess the statistical nature of the δB 's and differences observed by the various s/c platforms.

Analysis shows that Iridium Mag is in good agreement with DMSP for use in data assimilation modeling.

The figure on the left is of δB 's for a storm period on 29 May 2010 (from Knipp et al., 2014 – in review).





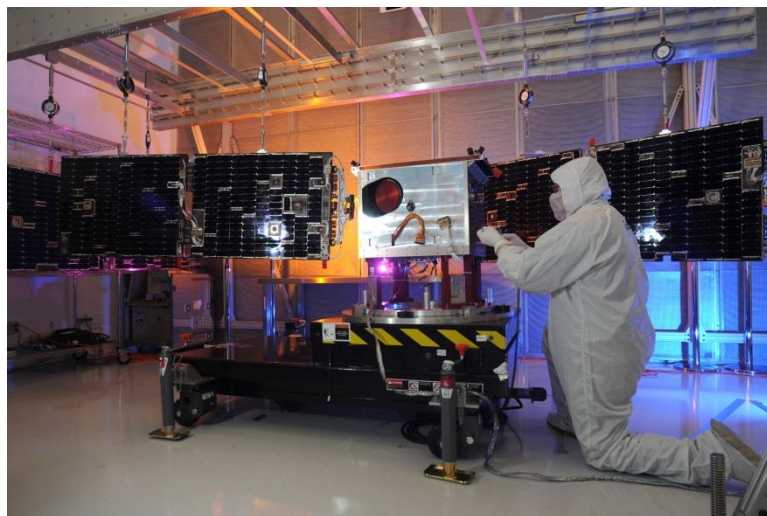
Space Weather Team

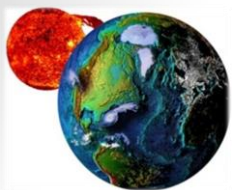
Status: Total Solar Irradiance (TSI)

The **Total Solar Irradiance Calibration Transfer Experiment (TCTE)** will study solar energy to help scientists understand the causes of climate change on our planet. TCTE will fly as a payload onboard a U.S. Air Force Space Test Program spacecraft known as STPSat-3, which was developed and built by Ball Aerospace. The satellite payload includes LASP's Total Irradiance Monitor (TIM). **The TCTE launch window is 19-24 Nov 2013.**

TCTE partly mitigates the loss of **Glory** for continuing the 34-year TSI satellite record after SORCE. A TSI follow-on free-flyer is planned for 2017 after which responsibility for the record will transfer from NOAA to NASA.

The NGDC archives include pre-satellite era data from the Smithsonian Astrophysical Observatory (1902-1954)





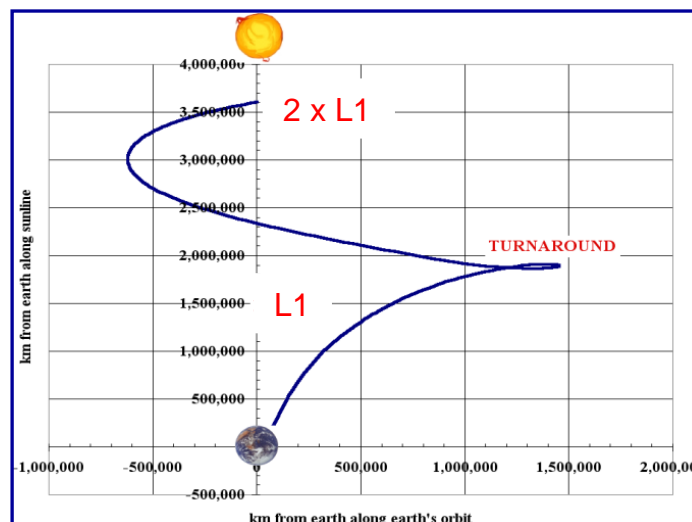
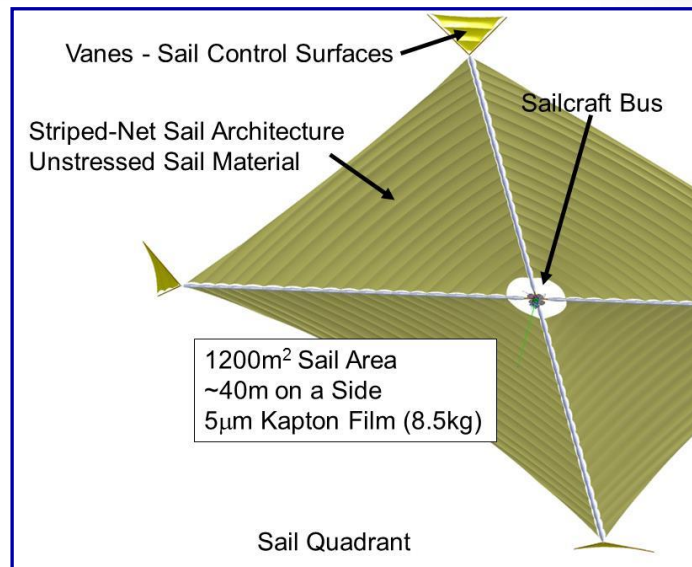
Space Weather Team

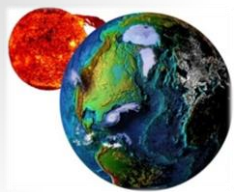
Status: SUNJAMMER

- Sunjammer is a NASA technology demonstration mission (TDM) to examine the propellant-less propulsion potential of solar sails.
- Mission will demonstrate sail maneuvers in its first 30 days – then fly to 2 x L1 and then out of the ecliptic plane.
- Co-launched with DSCOVR – 2QFY2015.
- Space weather instruments:
 - Particle spectrometer – MSSL
 - Magnetometer – Imperial College London
- NGDC responsibilities – Create a web presence and [metadata](#) record. Archive and data stewardship [TBD] – considered part of related DSCOVR support.

[Deployment](#)

[Trajectory](#)





Space Weather Team

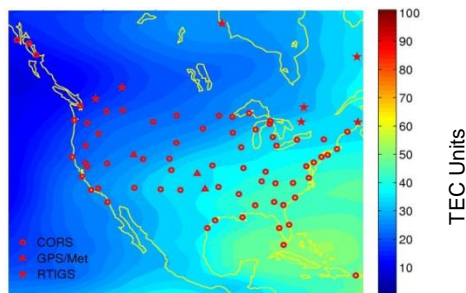
Status: COSMIC-2 (Slide provided to Dr. Thomas Burns for CSSP)

STP 4QFY13 12-NOV-13

Ionospheric
Specification

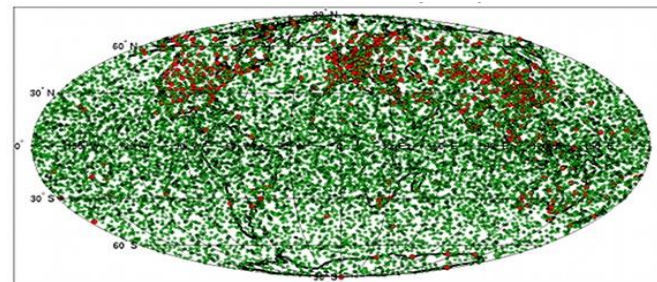
Enable a global deployment of the NOAA US-TEC model @ NWS/SWPC

- Reduce inaccuracies associated with the largest GNSS source of error
- Improved geo-positioning for surveying, farming, deep-sea oil extraction,
- Uniform global distribution of occultations avoids model biasing for land masses



Regional US-TEC model

Transition
to Global
Model

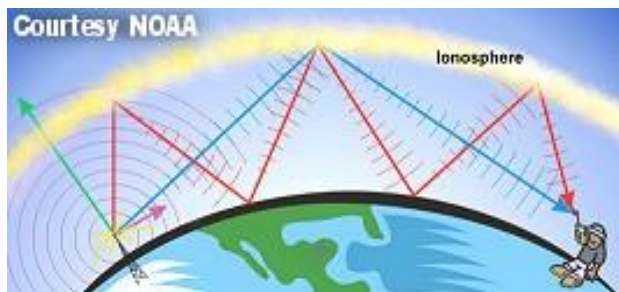


Model Input: > 8,000 occultations per day

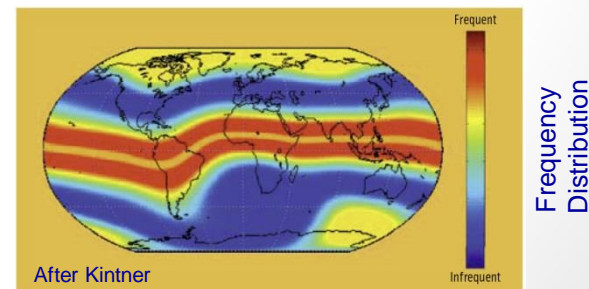
Ionospheric
Scintillation

Contribute to assured radiowave connectivity and precise geo-positioning

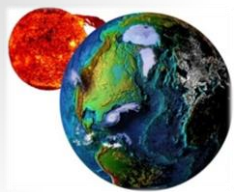
- Locate regions of ionospheric scintillation that affect communications
- Specify errors in geo-positioning due to selective loss of GNSS links (GDOP)



Assured Communications



Statistical distribution of scintillation



Ionospheric Sounding Team

Mission: Develop and Field Revolutionary Technologies for Advanced Ionospheric Sounding

NGDC innovated the new-technology
Vertical Incidence Pulsed Ionospheric
Radar (VIPIR)

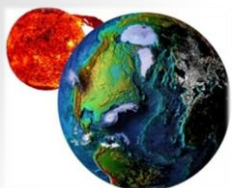
Actions:

- Acquire & disseminate to SWPC/AFWA real-time, ionospheric soundings from a global network of ground sensors. Data also disseminated to domestic and international partners.
- Demonstrate advanced capabilities for ionospheric sounding by VIPIR.
- Field new ground-based sensors in U.S., Africa and the Antarctic.
- Manage 70+ years of ionospheric sounding data. Key to understanding climate change impacts to geospace.
- One (1) 1QFY13 milestone.



Recent/Ongoing Activities (4QFY13):

- Supported the successful launch of the NASA Daytime Dynamo II sounding rocket (04 Jul).
- Awarded contract to install new Korean VIPIR at Jang Bogo Station, Antarctica (FY15 installation)
- Continued support to the Low latitude Ionospheric Sounding Network (LISN)



WDS for Geophysics



Mission: *Acquire, Manage, and Disseminate Solar-Terrestrial Data as a Member of the World Data Service*

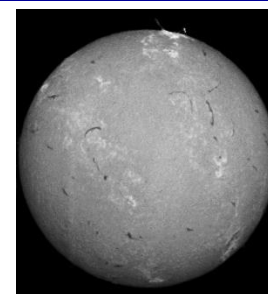
NGDC is responsible for a variety of environmental datasets from the sun's surface to the upper atmosphere

Actions:

- Preserve NOAA's historical solar/space environmental datasets and products (non-satellite).
- Acquire processed environmental datasets from solar observatories and the INTERMAGNET consortium.
- Manage and publish solar and geomagnetic indices from the 1600's to the present.
- Create metadata records for solar-terrestrial datasets in compliance with the ISO 19115 standard.
- One (1) 1QFY13 milestone.

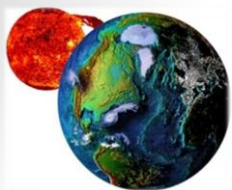


Historical H_{α} photos from the Boulder Solar Observatory (1967 – 1994) and other relevant datasets



Monthly Geophysical & Solar Indices Bulletins (pre 1985 – present) and other historical reports





CORS Team

Mission: *Maintain the Parallel Data Collection and Distribution Site for the NGS Continuously Operating Reference Stations (CORS)*

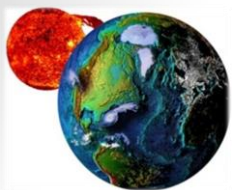
Manage and operate the CORS-West facility as an element of the NGS Continuity Of Operations Plan (COOP)

Actions:

- Acquire, process and distribute GPS receiver data from over 1900 ground-based sites.
- Provide real-time GPS data to the NWS/SWPC for the real-time U.S. Total Electron Content (USTEC) ionospheric model and to the ESRL/GSD Ground-Based GPS Meteorology Integrated Precipitable Water Vapor (IPW) model.
- Integrate CORS data into CLASS as the pathfinder for archiving all NGDC datasets.



GPS Receiver Antenna



OUTLINE

Solar & Terrestrial Physics Division

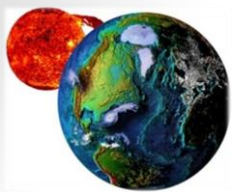
STP Division Overview

Milestones & Metrics

Accomplishments & Updates

➔ Professional Activities

Issues & Summary

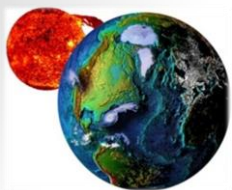


Professional Activities

STP FY13 Publications – 20 (Pg 1 of 3)

Publications (FY13):

- Araujo-Pradere, E.A., D. Buresova, **D.J. Fuller-Rowell** and T.J. Fuller-Rowell (2013), Initial results of the evaluation of IRI hmF2 performance for minima 22-23 and 23-24, *Adv. Space Res.*, 51, pp.630-638. **[Peer reviewed]**
- Baranyi, T., S. Kir'aly and **H.E. Coffey** (2013), Indirect comparison of Debrecen and Greenwich daily sums of sunspot areas, *Monthly Notices Royal Astronomical Society*, *advanced publication on-line*. doi:10.1093/mnras/stt1134
- Baugh, K., F.C. Hsu, C. Elvidge** and **M. Zhizhin** (2013), Nighttime Lights Compositing Using the VIIRS Day-Night Band: Preliminary Results, *Proc. Asia-Pacific Advanced Network*, 35, pp. 70-86, <http://dx.doi.org/10.7125/APAN.35.8>. **[Peer reviewed]**
- Denig, W.F.** (2012), Space Weather Products for NOAA Satellites, *Earth System Monitor*, 19, p.9.
- Green, J.** (2012)., Space Weather Ready, *Earth System Monitor*, 19, p.3.
- Elvidge, C.D., K. Baugh, M. Zhizhin** and **F.C. Hsu** (2013), Why VIIRS data are superior to DMSP for mapping nighttime lights, *Proc. Asia-Pacific Advanced Network*, 35, pp. 62-69, <http://dx.doi.org/10.7125/APAN.35.87>. **[Peer reviewed]**
- Elvidge, C.D., M. Zhizhin, F.C. Hsu** and **K. Baugh** (2013), What is so great about nighttime VIIRS data for the detection and characterization of combustion sources?, *Proc. Asia-Pacific Advanced Network*, 35, pp. 33-48, <http://dx.doi.org/10.7125/APAN.35.85> **[Peer reviewed]**
- Elvidge, C.D., M. Zhizhin, F.C. Hsu** and **K. Baugh** (2013), VIIRS Nightfire: Satellite Pyrometry at Night, *Remote Sens.*, 5, pp 4423-4449. doi: 10.3390/rs094423 **[Peer reviewed]**
- Erwin, E.H., H.E. Coffey, W.F. Denig, D.M. Willis, R. Henwood** and **M.N. Wild** (2013), The Greenwich Photoheliographic Results (1874 – 1976): Initial Corrections to the Printed Publications, *Solar Physics*, 288, pp. 157-170, DOI 10.1007/s11207-013-0310-z **[Peer reviewed]**

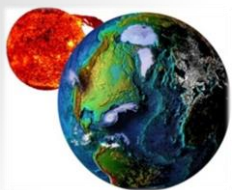


Professional Activities

STP FY13 Publications – 20 (Pg 2 of 3)

YTD Publications – continued:

- Jaynes, A.N., M.R. Lessard, **J.V. Rodriguez**, E. Donovan, **T.M. Loto'aniu** and K. Rychert (2013), Pulsating auroral electron flux modulations in the equatorial magnetosphere, *J. Geophys. Res.*, (published online), doi: 10.1002/jgra.50434. **[Peer reviewed]**
- Kress, B.T., **J.V. Rodriguez**, J.E. Mazur and M. Engel (2013), Modeling solar proton access to geostationary spacecraft with geomagnetic cutoffs, *Advances in Space Research*, <http://dx.doi.org/10.1016/j.asr.2013.08.019>. **[Peer reviewed]**
- Kyba, C.C.M., J.M. Wagner, H.U. Kuechly, C.E. Walker, **C.D. Elvidge**, F. Falchi, T. Ruhtz, J. Fischer and F. Holker (2013), Citizen Science Provides Valuable Data for Monitoring Global Night Sky Luminance, *Sci. Reports*, 3, DOI: 10.1038/srep01835.). **[Peer reviewed]**
- Machol, J.L.**, A.A. Reinard, R.A. Viereck and D.A. Biesecker (2013), Identification and replacement of proton-contaminated real time ACE solar wind measurements, *Space Weather*, (accepted manuscript online). **[Peer reviewed]**
- Neal, J.J., C.J. Rodger and **J.C. Green**, Empirical Determination of Solar Proton Access to the Atmosphere: Impact on Polar Flight Paths, *Space Weather*, (accepted manuscript online) **[Peer reviewed]**
- Rowland, W.**, and R.S. Weigel (2012), Intracalibration of particle detectors on a Three-axis Stabilized Geostationary Platform, *Space Weather*, 10, S11002, doi:10.1029/2012SW000816. **[Peer reviewed]**
- Redmon, R.J.**, W.K. Peterson, L. Andersson, P.G. Richards (2012), Dawnward shift of the dayside O⁺ outflow distribution: The importance of field line history in O⁺ escape from the ionosphere, *J. Geophys. Res.*, <http://dx.doi.org/10.1029/2012JA018145> **[Peer reviewed]**
- Sakaguchi, K., Y. Miyoshi, E. Spanswick, E.F. Donovan, I.R. Mann, V.K. Jordanova, K. Shiokawa, M. Connors, and **J.C. Green** (2012), Visualization of ion cyclotron wave and particle interactions in the inner magnetosphere via THEMIS-ASI observations, *J. Geophys. Res.*, doi:10.1029/2012JA018180, in press. **[Peer reviewed]**



Professional Activities

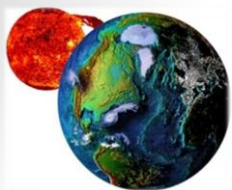
STP FY13 Publications – 20 (Pg 3 of 3)

YTD Publications – continued:

- Willis, D.M., **H.E. Coffey**, R. Henwood, **E.H. Erwin**, D.V. Hoyt, M.N. Wild and **W.F. Denig** (2013), The Greenwich Photo-heliographic Results (1874 – 1976): Summary of the Observations, Applications, Datasets, Definitions and Errors, accepted for publication in *Solar Physics*, 288, pp. 117-139, DOI 10.1007/s11207-013-0311-y. **[Peer reviewed]**
- Willis, D.M., R. Henwood, M.N. Wild, **H.E. Coffey**, **W.F. Denig**, **E.H. Erwin** and D.V. Hoyt (2013), The Greenwich Photo-heliographic Results (1874 – 1976): Procedures for Checking and Correcting the Sunspot Digital Datasets, accepted for publication in *Solar Physics*, 288, pp. 141-156, DOI 10.1007/s11207-013-0312-x. **[Peer reviewed]**
- Zhizhin, M, C.D. Elvidge, F-C. Hsu and K.E. Baugh** (2012), Using the Short-Wave Infrared for Nocturnal Detection of Combustion Sources in VIIRS Data, *Proc. Asia-Pacific Advanced Network*, 35, pp. 49-61, <http://dx.doi.org/10.7125/APAN.35.6>. **[Peer reviewed]**

Total accepted or published: 20

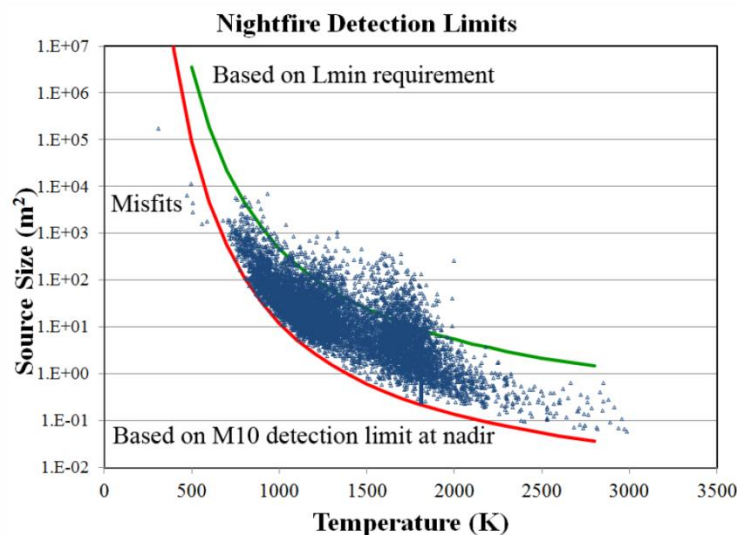
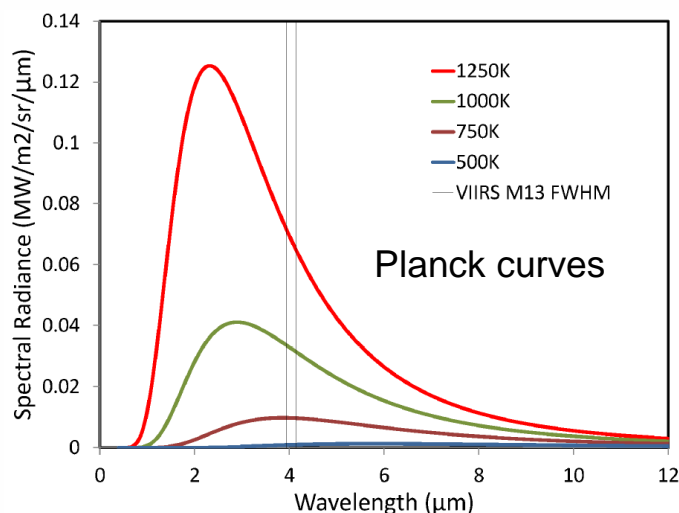
➤ **Peer Reviewed: 18 (AOP Metric)**



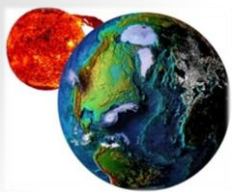
Professional Activities

Featured Publication

Elvidge, C.D., M. Zhizhin, F-C Hsu, K.E. Baugh (2013) **VIIRS Nightfire: Satellite Pyrometry at Night**, *Remote Sens.*, 5, 4423-4449. <http://www.mdpi.com/2072-4292/5/9/4423>.



“The advantage of Nightfire over other global fire observation data sources is the ability to consistently model Planck curves from sub-pixel heat sources over a wide span of temperatures. To our knowledge, it is the only satellite fire detection system which estimates temperature and source size for biomass burning, gas flares, and volcanoes worldwide on a daily basis.”

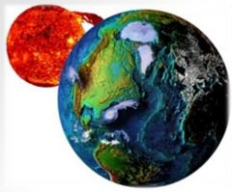


Professional Activities

Professional Activities (1 of 2)

Submitted NASA/NSF Proposals:

- Data Services Upgrade to the GOES Solar Extreme Ultraviolet Irradiance Measurements, *submitted to Heliophysics Infrastructure and Data Environment Enhancements (NASA)*, **J. Machol**, A. Milan, **W. Denig**, R. Viereck, A. Jones and F. Hill
- 47 years of magnetism: Preserving a unique archive for long-term solar variability studies, *submitted to Heliophysics Infrastructure and Data Environment Enhancements (NASA)*, **A. Reinard**, R. McFadden, I. Hewins, F. Hill and **W. Denig**
- Magnetosphere-Ionosphere coupling during strong forcing of the magnetosphere by the solar wind as monitored by ground-satellite conjunctions across the auroral oval, *submitted to Heliophysics Supporting Research (NASA)*, C. Farrugia, P.E. Sandholt and **W. Denig**
- Polar Cap Auroral Fine Structure: Origins, *submitted to Heliophysics Supporting Research (NASA)*, M. Samara, R. Michell and **R. Redmon**.
- Solar wind driving of magnetospheric ULF power and consequences for radiation belt dynamics, *submitted to Heliophysics LWS Science (NASA)*, S. Elkington, M. Wiltberger, **R. Redmon**, S. Kanekal, D. Malaspina, H. Singer, I. Mann and S. Claudepierre.
- Data Services Upgrade: Enabling heliophysics climatology research with improved POES/MetOp particle data, *submitted to Heliophysics Infrastructure and Data Environment Enhancements (NASA)*, S.Huston, **J.C. Green** and C. Randall
- From Sun to Earth - Forecasting and understanding the geomagnetic effects of solar wind originating in coronal holes, *submitted to Heliophysics Targeted Research and Technology (NASA)*, L.Krista, **J.V. Rodriguez** and **J.C. Green** – **DECLINED**
- Drift phase structure as a diagnostic of different radial transport mechanisms in the outer radiation belt, *submitted to Heliophysics Targeted Research and Technology (NASA)*, T.P. O'Brien, T. Mulligan, **J.C. Green** and I. Mann. – **FUNDED**
- Quantifying the correlation between chorus waves, energetic electron precipitation, and diffuse aurora and their dependence on solar wind activity, *submitted to Heliophysics Supporting Research (NASA)*, W. Li, J. Bortnik, Y. Nishimura, B. Ni and J. C. Green
- Will we recognize the space weather tsunami?, *submitted to Heliophysics Targeted Research and Technology (NASA)* **J.C. Green**, E.J. Rigler, Y. Shprits, and T.P. O'Brien. – **DECLINED**
- Energy budget and large-scale aspects of pulsating aurora, submitted to Heliophysics Guest Investigators, E. Lund, C.-L. Huang, **J. Rodriguez**, M. Lessard [also submitted to NSF Magnetospheric Physics Program]
- Study the Precipitation of Radiation Belt Electrons during the Rapid Dropout Events, Submitted to Geospace Environmental Modeling (NSF/GEM, NSF 10-510), W. Tu, Y. Chen, and **J.C. Green**.



Professional Activities

Professional Activities (2 of 2)

Journal Refereed Reports / Proposal Reviews:

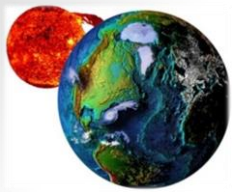
R. Redmon – JGR-Blue (May 2013)

J. Green – JGR-Blue (Oct 2012); JGR-Blue (Dec 2012); Science (Feb 2013)

J. Rodriguez -- Space Weather (Oct & Nov 2012), JGR-Blue (Apr & Jul 2013)

W. Denig – JGR-Blue (Dec 2012); JGR-Blue (Jul 2013), JGR-Blue (Jul 2013), NSF CNIC Proposal (Sep 2013)

C. Elvidge – J-STARS (IEEE), Remote Sensing (3), EOS (AGU), Remote Sensing Envir. (2), Intl J. Remote Sensing (2), GISci Remote Sensing, ISPRS J Photogrammetry & Remote Sensing, Proc. APAN, Sociological Meth., PLOS ONE, Geosci Remote Sens. Lett., Bull. AMS



OUTLINE

Solar & Terrestrial Physics Division

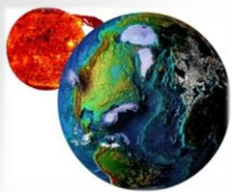
STP Division Overview

Milestones & Metrics

Accomplishments & Updates

Professional Activities

➔ Issues & Summary



Issues & Summary

Solar & Terrestrial Physics Division

- ✓ NGS Aerial Photography (4QFY13/slide 17) – Recommend NGS input
- ✓ GOES-R SWx Algorithm Risks (4QFY13/slide 23) – Tracking
- ✓ Federal travel restrictions limit program growth (4QFY12) – Improving
- ✓ Fed hiring restrictions having mission impact (3QFY12) – **Critical**
- ✓ GOES-R L2+ SWx algorithms (3QFY11) – *No change*
 - Frozen Baseline / Algorithm Readiness – Waivers (slide #23)
 - GOES L0 Data Not in CLASS – Still undefined (outstanding issue)
 - GOES-R Data Management Tasks – GOES-R Feds (slide #3)

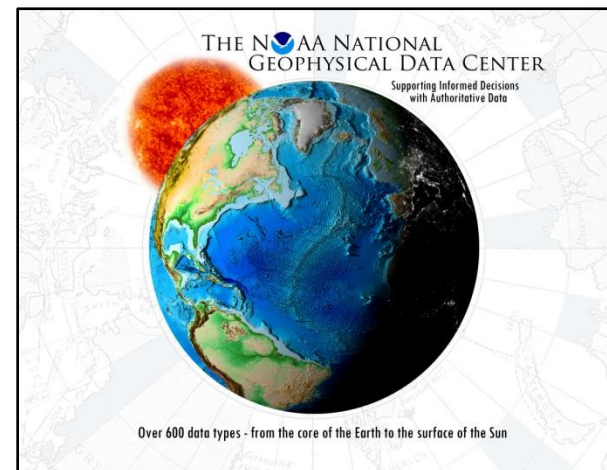
Metrics

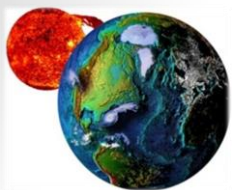
Papers Published (FY13): 20

✓ Peer Reviewed: 18

Presentations (FY13): 42

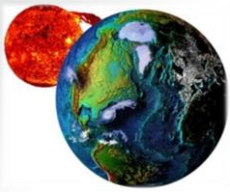
✓ List in Backup Slides



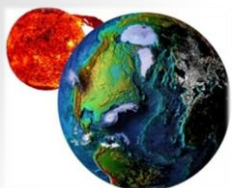


QUESTIONS?



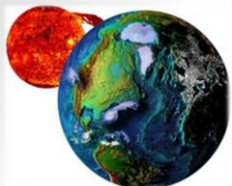


BACKUP SLIDES



Backup Agreements – Status

Agreements											
Scope	Team	Type	Partner	NOAA Legal	DOC Legal	NGDC Signed	Partner Signed	Start	End	Status	
CORS Support	CORS	AGR	NGS	n/a	n/a	X	X	10/01/2003	09/30/2016	G	Extension in place (FY14-16)
SWx Climatology	SWX	MOU	AFCCC	X	X	X	X	05/27/2004	10/01/2014	G	In place - no FY13 activity
GPS Data (CORS)	SWX	MOA	Multi	n/a	n/a	X	X	09/20/2004	n/a	G	Biannual Review - waiting on NGS
Ionosonde Sites	SWX	IA	USGS	X	X	X	X	04/03/2009	04/03/2014	G	Renewal in process
ViRBO	SWX	MOA	NASA	X	X	X	X	04/15/2009	n/a	G	In place - no FY13 activity
SEM-N - AFRL	SWX	MOA	AFRL	X	X	X	X	05/11/2009	05/11/2014	G	In place - no FY13 activity
Nighttime Lights	EOG	MOU	DOE	X	X	X	X	08/12/2009	08/12/2013	G	Renewal under discussion
DoD/USAF	EOG	MOU	NASIC	X	X	X	X	03/09/2011	01/30/2015	G	In place - nothing to report
Gas Flaring	EOG	SA	WBank	X	X					G	Renewal in process
Global CO2	EOG	AGR	NASA	n/a	n/a	n/a	n/a	07/29/2011	n/a	G	Renewed annually
Nighttime Lights	EOG	SA	HAIL							G	In process - 3-year agreement
											As of 06 Nov 2013
											G No Action Needed
											Y Watch Item
											R Action Required



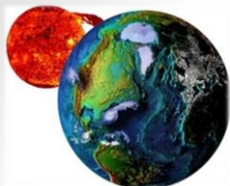
Backup

STP Annual Data Ingest¹ – 4QFY13

	CY11 GB	CY12 GB	CY13 GB
GOES SEM	71	80	58
GOES SXI	1,731	1899	1,672
POES SEM	29	29	15 ¹
DMSP OLS	5,130	5,020	4,280 ¹
CORS GPS	24,456	25,611	20,942 ¹
Ionosonde	900	907 ²	750 ²

¹Uncompressed data volumes

²Does not include VIPIR



Backup

GOES Spacecraft/Instrument Status

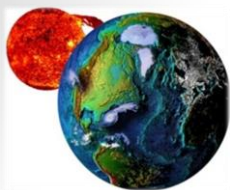
Spacecraft	Series	Operational Status	Status	Magnet1	Magnet2	Magnetometer 1	Magnetometer 2	MAG	XRS	XRS-EUV	EXIS	EPS	HEPAD	SEISS	XRP	SXI	SUVI
GOES 12	GOES I-M	South America	G	G	G				R			Y	G		R	R	
GOES 13	GOES N-O-P	Operational East	G			G	G			Y		G	G			Y	
GOES 14	GOES N-O-P	Standby	G			G	G			G		G	G			G	
GOES 15	GOES N-O-P	Operational West	G			G	G			G		G	G			G	
GOES R	GOES R	Acquisition						ACQ			ACQ			ACQ			ACQ
GOES S	GOES R	Acquisition						ACQ			ACQ			ACQ			ACQ
GOES T	GOES R	Acquisition						ACQ			ACQ			ACQ			ACQ
GOES U	GOES R	Acquisition						ACQ			ACQ			ACQ			ACQ

As of: 16 Jul 2013

Operational (or capable of)	G
Operational with limitations (or Standby)	Y
Operational with Degraded Performance	O
Not Operational	R
Acquisition	ACQ

SWPC operations use GOES-15 SEM & SXI, No GOES-14 data, GOES-13 SEM (no XRS) and SXI.





Professional Activities

STP FY13 Presentations – 42 (Pg 1 of 4)

YTD Presentations (FY13):

High Energy Particle Precipitation into the Atmosphere (HEPPA) – 09-11 October 2012, Boulder, CO

- Update on the NOAA Polar Satellite Program, Data, and Products (Poster), **J. Machol, J. Green, W. Denig, T. Sotirelis, D. Wilkinson, J. Rodriguez and R. Redmon**

Extreme Ultraviolet Variability Experiment (EVE) Science Meeting - 31 October -1 November 2012, Yosemite Valley, CA

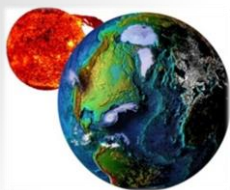
- The Use of EVE Data at NOAA (Invited Oral), **J. Machol**

Conference on Space Environment Applications, Systems, and Operations for National Security (SEASONS), 14-16 November 2012, Laurel, MD

- NOAA Satellite Anomaly Program (Oral), **J.C. Green** (Paper presented by G. Fisher)

American Geophysical Union, 03-07 December 2012, San Francisco, CA

- Intracalibration of Particle Detectors on a Three-Axis Stabilized Geostationary Platform (Poster), **W. Rowland**, and R. Weigel, (Paper: SM31B-2304)
- New NOAA resources for safeguarding the satellite infrastructure from space weather (Poster), **J.C. Green; W.F. Denig; J.V. Rodriguez; R.J. Redmon**; T.G. Onsager, H.J. Singer, W. Murtagh, R. Rutledge, J. Stankiewicz, J. Kunches and **D.C. Wilkinson** (Paper: SM23B-2316)
- NOAA People Empowered Products (PeEP): Combining social media with scientific models to provide eye-witness confirmed products (Oral), **S. Codrescu, J.C. Green, R.J. Redmon, W.F. Denig and E.A. Kihn** (Paper: IN23F-02) (Paper presented by J. Rodriguez)
- Non-standard Space Weather Products and Services from NOAA (Oral), **W.F. Denig** and R.A. Viereck (Paper: IN31D-03)
- Dawnward shift of the dayside O⁺ outflow distribution and the Influence of e- precipitation on ion upwelling in the nightside auroral zone (Poster), **R.J. Redmon**, L. Andersson, W.K. Peterson and P.G. Richards (Paper: SM41B-2215)
- GOES Observations of Pitch Angle Evolution During an Electron Radiation Belt Dropout (Poster), D.P. Hartley, M.H. Denton, **J.C. Green**, T.G. Onsager, J.V. Rodriguez and H.J. Singer (Paper: SM31C-234)
- Numerical Simulations of the Ring Current During Geomagnetic Storms (Invited Oral) M.W. Chen, C.Lemon, T.B. Guild, M. Schulz; J.L. Roeder; A.Lui, A.M. Keesee, J.Goldstein, G. Le and **J.V. Rodriguez** (Paper: SM32A-03)



Professional Activities

STP FY13 Presentations – 42 (Pg 2 of 4)

YTD Presentations (continued):

American Geophysical Union, 03-07 December 2012, San Francisco, CA (continued)

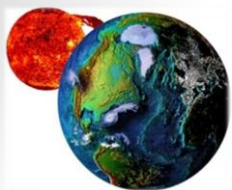
- Pulsating Aurora: the Equatorial Source Population & Local Morphological Interplay with Diffuse Aurora (Poster), A.N. Jaynes, M. Lessard, **J.V. Rodriguez**, K.M. Rychert, E. Donovan, R.G. Michell and M. Samara (Paper: SM43B-2240)
- Comparison of Geomagnetically-shielded Solar Energetic Proton Fluxes Observed at Geostationary Orbit by GOES and in Low-earth Orbit by SAMPEX, POES and MetOp (Poster), **J.V. Rodriguez**, J.E. Mazur, **J.C. Green** and **J.L. Machol** (Paper: SH33C-2243)
- Real-time mapping of combustion sources using Suomi NPP satellite VIIRS and CrIMSS data (Poster), **M Zhizhin**, **C. Elvidge**, **K. Baugh** and **F.C. Hsu** (Paper: IN33C-1553)

American Meteorological Society, 06-10 January 2013, Austin, TX

- The GOES-R Sudden Impulse Detection Algorithm (Poster), **W. Rowland**, **R. Redmon** and H.J. Singer (Paper 315)
- GOES-R solar extreme-ultraviolet irradiance: requirements, observations, and products (Poster), **J.L. Machol**, R.A. Viereck, A. Reinard, F.G. Eparvier, M.Snow, A.R. Jones, T.N. Woods, **W.F. Denig**, D.L. Woodraska and S. W. Mueller (Paper 304)
- Development of a Proxy Data Set for the Energetic Heavy Ion Sensor (EHIS) in the GOES-R Space Environment In-Situ Suite (Poster), **R. Bharath**, **J.V. Rodriguez**, **J.C. Green** and **W.F. Denig** (Paper 296)
- Improved Space Weather Monitoring for GOES-R (Invited Oral), **W.F. Denig** and S.M. Hill (Paper J2.4)
- Automatic Analysis of EUV Solar Features using Solar Imagery for the GOES-R SUVI (Poster), **J.M. Darnel**, S.M. Hill and **W.F. Denig** (Paper 660)

Asia Pacific Advanced Network (APAN), 13-18 January 2013, Honolulu, HI

- What is so great about nighttime VIIRS data for the detection and characterization of combustion sources? (Oral), **C. Elvidge**
- Using the short-wave infrared for nocturnal detection of combustion sources in VIIRS data (Oral), **M. Zhizhin**
- Estimating temperature and total radiant output for combustion sources detected at night in VIIRS data (Oral), **Feng-Chi Hsu**
- Ranking gas flares based on radiant output (Oral), **K. Baugh**
- Why VIIRS data are superior to DMSP for mapping nocturnal lighting (Oral), **C. Elvidge**
- A stray filter for improving the quality of VIIRS low light imaging data (Oral), **M. Zhizhin**
- The NGDC VIIRS reprojection toolkit (Oral), **M. Zhizhin**
- A VIIRS cloud detection system optimized for cloud-free compositing (Oral), **Feng-Chi Hsu**
- VIIRS cloud-free compositing for nighttime lights (Oral), **K. Baugh**



Professional Activities

STP FY13 Presentations – 42 (Pg 3 of 4)

YTD Presentations (continued):

Earth-Sun System Exploration 5 - January 13-19, Kona, HI

- Creation and analysis of a novel auroral dataset derived from DMSP satellite observations (Poster), **J.V. Mills, R.J. Redmon, W. K. Peterson, L. Andersson and W.F. Denig.**
- Dynamic auroral boundaries and ion energization: Solar cycle 23 (Oral, Invited), **R.J. Redmon, W.K. Peterson, L. Andersson, P.G. Richards, W.F. Denig and J. Mills**

Boulder Solar Days

- Using GOES-R Data for Solar Observations (oral), **J. Darnel**

NOAA Satellite Conference, 08-12 Apr 2013, College Park, MD

- Societal Impacts of Space Weather (Poster), **W.F. Denig** and S. Hill

Space Weather Workshop – 16-19 April 2013, Boulder, CO

- NOAA Resources for Safeguarding the Satellite Infrastructure from Space Weather (Oral), **J.C. Green**
- NOAA Operational Space Environmental Monitoring – Current Capabilities and Future Directions (Oral), **W.F. Denig** and P. Mulligan
- Intercalibration of GOES 8-15 Solar Proton Measurements (Poster), **J. Rodriguez**
- A High Resolution Observation of an Ionospheric Disturbance Over Hurricane Sandy (Poster), **J. Mabie, K. Horan and T. Bullett**

Workshop on Inter-Calibration and Degradation of EUV Instruments – 15-18 April 2013, Brussels, Belgium

- Preliminary calibrations of GOES EUVS (Oral), **J. Machol**

Spacecraft Anomalies and Failures Workshop – 05 June 2013, Chantilly, MD

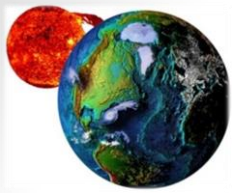
- NOAA resources for safeguarding the satellite infrastructure from space weather (Oral), **J.C. Green, W. Denig, J. Rodriguez, R. Redmon, S. Codrescu, T. Onsager, H. Singer, W. Murtagh, R. Rutledge, J. Stankiewicz, J. Kunches, D.C. Wilkinson** and M. Mullholland

Geospace Environment Modeling (GEM) Workshop, 16-21 June 2013, Snowmass, CO

- New NOAA data, products and research on Earth's radiation environment, (Poster), **J.C. Green, W. Denig, J. Rodriguez, R. Redmon, S. Codrescu, T. Onsager, H. Singer**
- Using crowd sourced auroral observations to validate OVATION, **S. Codrescu, Kelton Minor, J.C. Green, R. Redmon**

Space Foundation Teachers, 13 Jun & 20 Jun 2013, Boulder, CO

- NOAA Satellites and Data Centers, **W. Denig**



Professional Activities

STP FY13 Presentations – 42 (Pg 4 of 4)

YTD Presentations (continued):

SDO EVE Working Group Meeting on 24-26 September 2013, Boulder, CO

- Extreme ultraviolet comparisons, S. Wieman, A. Jones and **J. Machol**
- Space weather operations, R. Hoch and **J. Machol**